



# PharmaD Program

Second year Pharm-D  
student

# Phospholipase

By:  
Balqees Madi 2649  
Haneen Saad 2468



# ILO'S

**01**  
**Define  
phospholipase**

**02**  
**List types  
phospholipase**

**03**  
**Identify sources  
of phospholipase**

**04**  
**Describe the action  
of phospholipase  
on phospholipid**

**05**  
**List the  
application of  
phospholipase**



# Introduction

A phospholipase is an enzyme that hydrolyzes phospholipids into fatty acids and other lipophilic substance



# Types phospholipase

There are four major classes, termed



**Phospholipase A**



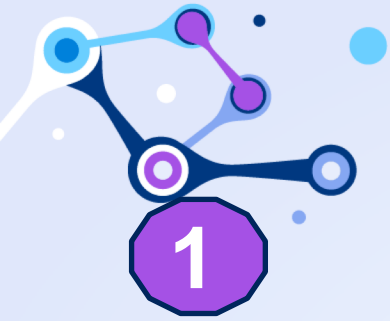
**Phospholipase B**



**Phospholipase C**



**Phospholipase D**



# Sources phospholipase



1

2

3

4

## Phospholipases A2

Have been isolated from different venoms (snake, bee, and wasp), from virtually every studied mammalian tissue (including pancreas and kidney) as well as from bacteria.

## Phospholipase B

enzymes harbor distinct activities: a fatty acid ester hydrolase, a PLB activities have been described in humans and other mammals , bacteria and especially in fungi

## Phospholipase c

This enzyme is found in mammals in general, and that of thirteen species, there are several accompanying factors that activate these enzymes, including tyrosine kinase, small proteins and phospholipids

## Phospholipase D

is an enzyme of the phospholipase superfamily. Phospholipases occur widely, and can be found in a wide range of organisms, including bacteria, yeast, plants, animals, and viruses



**A**

Phospholipase A  
Phospholipase A1 – cleaves the SN-1 acyl chain (where SN refers to stereospecific numbering).  
Phospholipase A2 – cleaves the SN-2 acyl chain, releasing arachidonic acid

# Action of phospholipase

Phospholipase B – cleaves both SN-1 and SN-2 acyl chains; this enzyme is also known as a lysophospholipase

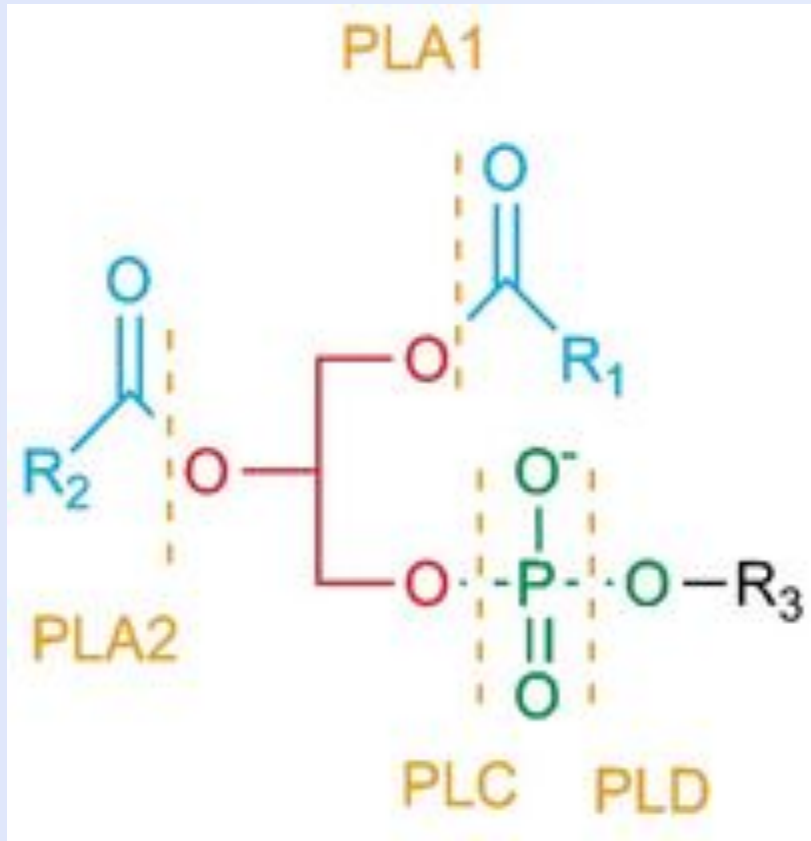
**B**

**C**

Phospholipase C – cleaves before the phosphate, releasing diacylglycerol and a phosphate-containing head group..

Phospholipase D – cleaves after the phosphate, releasing phosphatidic acid and an alcohol

**D**



Action of  
phospholipase

# Application of phospholipase

1

Removal of impurities in vegetable oil with the help of phospholipases, such as vegetable oil degumming. Vegetable oil contains phospholipids, which have a negative impact on the storage stability and the downstream processing of the oil. so Phospholipase A-mediated oil degumming

3

Phospholipase activities were shown to provide even better emulsification in the dough.

2

The hydrolysis of milk phospholipids with phospholipase A1 from (fungi) significantly increased the cheese yield through better moisture and fat retention.

4

There is a lot of interest in phospholipases from a physiological and pharmaceutical processes has grown hand in hand with our ability to clone and express the genes in microbial hosts, the use processes is increasing through the ability of optimizing the enzymes by protein engineering.



# References

1-<https://www.google.com/search?q=A+phospholipase+is+an+enzyme+that+hydrolyzes+phospholipids%5B1%5D+into+fatty+acids+and+other+lipophilic+substances.&oq=A+phospholipase+is+an+enzyme+that+hydrolyzes+phospholipids%5B1%5D+into+fatty+acids+and+other+lipophilic+substances.&aqs=chrome..69i57j69i64.956j0j4&sourceid=chrome&ie=UTF-8>

2-<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2077850>

3-phospholipase" at Dorland's Medical Dictionary ^ Yu JE, Han SY, Wolfson B, Zhou Q (2018).

"The role of endothelial lipase in lipid metabolism, inflammation, and cancer". *Histology and Histopathology*. 33 (1): 1–10. doi:10.14670/HH-11-905. PMC 5858721. PMID 28540715. ^ D. M. Vasudevan & S. Sreekumari, *Textbook of Biochemistry* (5th ed

4-[https://faculty.washington.edu/gelb/documents/10.1007\\_978-1-61779-600-5\\_4.pdf](https://faculty.washington.edu/gelb/documents/10.1007_978-1-61779-600-5_4.pdf)



Thanks

